

BIOLOGICAL NOTES

THE SHINING SLAVE-MAKER (*Polyergus lucidus*).—The Rev. H. M'Cook is as fortunate as he is energetic in his studies of the American ants. At the December 1880, meeting of the Academy of Natural Sciences of Philadelphia he read a paper on the discovery at the foot of the Allegheny Mountains, near Altoona, of a nest of *Polyergus lucidus*, the American representative of the Legionary Ant of Huber (*P. rufescens*), an ant associated with that author's discovery of ant-nests, in which certain ants have associated with them, in a sort of slavery, ants of another species. The nest had four gates separated a few inches from each other; the chambers were placed one above the other, united by tubular galleries. In an inner ovoid chamber numbers of the ants, male and female, appeared; mingled with these in large numbers were workers in three forms—major, minor, and dwarf of *Formica schaufussii*. A portion of the excavated nest was broken into, and on the next day but one was visited. None of the shining ants were at work, but the "slaves" were very busy cleaning out the galleries; a portion of the slaves were engaged in an extensive migration; a few were carrying their fellows, but for the most part the deportation was confined to the males and females of the shining ants. It was wonderful to see the large virgin-queens carried up the perpendicular face of the cutting for eighteen or twenty inches, and then for the distance of six feet over the ground and through the grass, and this in a few seconds over a minute. The shining ants are able to take a most wonderful grip. One of them had fallen under the displeasure of another, who held her firmly grasped by the middle thorax. Anxious to preserve the colony from unnecessary loss, Mr. M'Cook lifted the two out on the point of a quill toothpick, laid them on his hand, and thrust the fine point of the quill between the jaws of the aggressor, and so teased her that she released her fellow. The rescued ant instantly clasped the palm of his hand, threw her abdomen under her, and then, with back curved like that of an angry cat, sawed and tugged away at the skin until an abrasion was made. The other ant still clung fast by her mandibles only to the toothpick's point, her body stretched out into space, her limbs stretched outwards, except one hind leg, which was a little bent upward, and thus without any perceptible support except that which her jaws gave her upon the quill-point, she hung outstretched for several minutes. About a month after its discovery the nest was again visited; it was abundantly peopled; the winged forms of the shining ant were however gone. Having succeeded in colonising these ants Mr. M'Cook was able to confirm in many particulars the statements of Huber, Forel, and others, but he never happened to see the slaves feeding their masters. He noticed that they seemed to like to move towards both warmth and light, but he does not seem to have settled the question whether they would not prefer the warmth without the light. They would appear to be very clean in their ways and persons. Various experiments seemed to establish the fact that these slave-makers always keep a guard ready at once for any attack.

ON THE RED COLOUR OF SALT COD.—During the hot and damp weather of summer in the United States the dried codfish sometimes exhibit a peculiar redness of colour. These red fish, as is well known, putrefy comparatively quickly, and this fact, taken in connection with the disagreeable, and in such fish unusual, colour, renders them unfit for market, so that in seasons when the redness prevails dealers in codfish suffer often very considerable losses. Prof. Farlow, M.D., was requested by the United States Fish Commission to investigate this subject, and his report appears in the Fish Report for 1880. In September, 1878, he went to Gloucester to examine the fish stores. The weather was at that time hot and damp, and the codfish then being prepared for the market were largely affected by the redness. This redness disappears with the return of cool weather. In most cases it does not appear until the fish have been landed from the vessels, though in a few cases the colour has appeared in the stock while still on board. A microscopical examination showed that the redness was owing to a very minute plant, *Clathrocystis roseo-persicina*, a species known to be closely related to *C. aruginosa*, so common in fresh-water ponds, and which has lately come into public notice in the States in consequence of the so called pig pen odour which it exhales when decaying. This red species is known both in America and Europe, and has been recently investigated by Cohn and others. It may sometimes be found tinging the surface of damp ground with a purplish tinge, and the anatomist is not unfamiliar with it as

growing in his macerating tubs. It would appear not to flourish or increase very rapidly at a temperature below 65° Fahr. How it got to attack the dried fish was the next question. It was found that the plants could come from many sources, for it was found present in quantities in the wood-work of the wharves and packing-stores, but above all Prof. Farlow detected it in the salt with which the fish were cured. The salt from Cadiz had even a slight rose tinge. It will be a matter of interest, which perhaps some of our readers may help to solve, as to whether this plant is known in European fish-stations. In the great Norwegian cod-fisheries the temperature may not be high enough to favour its growth. As remedies Prof. Farlow suggests care in the selection of salt, and the constant cleaning of all wood-work or vessels that may come in contact with the fish. In addition to the red alga small quantities of cells destitute of colouring-matter and arranged in fours were not unfrequently found in the infected cod-fish. These suggested the genus *Sarcina*, but were not *S. ventriculi*. They rather, except in the absence of colouring-matter, resembled *Glacapsa crepidinum*, Thuret, which species is common enough on the wood-work of the Gloucester wharves. While there is this resemblance Prof. Farlow prefers for the moment, and pending further investigation, to call it a *Sarcina*, and to describe it as a new species (*S. ? morrhue*).

MARINE ISOPODS OF NEW ENGLAND.—One of the most remarkable papers forming the extensive series of appendices to the Report of the United States Commissioners of Fish and Fisheries for 1878 is perhaps that by Oscar Harger on the marine Isopods of New England and adjacent waters. The limits chosen commence at Nova Scotia to the north and extend southwards to New Jersey. Forty-six species are recorded, and figures of these with the requisite details of anatomy are given on thirteen plates; several new species and one new genus (*Syscenus*) are described. It will be noted that the number of species is very considerably less than that known to frequent the British coasts, and of the former only eight are identical with British forms. This difference is very marked in the genus *Sphæroma*, of which genus there is but one species native to New England, while Bate and Westwood describe a dozen species belonging to this family as natives of Britain. *Limnoria lignosum*, one of the most destructive of the group, is apparently as common on the American coasts as on our own shores. It does not usually occur much below high-water mark, though Prof. Verrill has found it at a depth of ten fathoms in Casco Bay, and it was dredged by the U.S. Fish Commission at a depth of 7½ fathoms in Cape Cod Bay, Massachusetts. Of the family of the Cymothoidæ, of which we believe as yet no species has been found around the British Islands, three species belonging to three different genera are in Mr. Harger's list.—To this memoir there is appended a very complete list of authorities and an alphabetical index.

STATISTICS OF DISEASE IN ITALY.—In a recent paper to the Lombard Institute, Prof. Sangalli gives statistics of the diseases which terminated fatally in the Civic Hospital of Pavia during the period 1855 to 1881. The material was 6644 bodies which came up for autopsy, and the causes of death were, in decreasing order, genuine inflammation, 4504 deaths; tuberculosis, 808; pyæmia, 337; cancer, 366; hepatic cirrhosis, 252; extravasation of blood in the brain, 254; chronic ulcer (gastric and duodenal), 72, &c. (there being 2140 deaths apart from those by true inflammation). The 4504 deaths from inflammation presented 7962 separate inflammations. The deaths from tuberculosis are seen to be about 12 per cent. The ages most exposed to that disease lie between 20 and 30; next come those between 10 and 20, and between 30 and 40, about equal. There were twelve cases between 70 and 80, and one in an old man of 84. It does not appear that one sex suffers more than the other. Cancer occurs most between 50 and 60, and most largely in liver, lymphatic glands, and stomach. The patients were largely of the peasant class, and the author cannot support Niemeyer's view, that people living in marshy districts, liable to malaria, have a certain immunity from tuberculosis. Nor do the figures confirm the asserted tendency of ulcer in the stomach to favour the development of tuberculosis. Pyæmia appeared mostly in the lungs (149 cases out of 470), pleura, 99; liver, 73, &c. In some years there was a remarkable diminution of this disorder.

THE EYE AND INTENSITY OF COLOUR.—With an apparatus consisting of two Nicols with a gypsum plate between, and a spectroscope with a third Nicol attached to the eye-piece, Herr Dobrowolsky has examined the sensibility of the eye to spectral

colours with different intensities of light (Pflüger's *Archiv*, v. 24, p. 189). From a large number of measurements it was found that, on an average, the red-colour sensation first occurred with a light-quantity equal to $\frac{1}{333}$, while for blue the lowest amount of light was $\frac{1}{15135}$. Thus blue gives a sensation with an amount of light sixteen times less than that required for red. With rise in the degree of brightness, the increase of sensibility to red proceeds pretty regularly; but for blue the increase becomes gradually greater (with the weakest degrees of brightness this increase was = 0.22, with the strongest 0.82, with the mean 0.36). Comparing the two sensibilities together, from the maximum of light strength to the minimum, the sensibility to blue is always found to exceed that to red (maximum thirteen and a half times, minimum sixteen times, mean four times).

ISOETES LACUSTRIS.—In an interesting paper read before the Academy of Sciences of Paris (January 10, 1881), M. E. Mer calls attention to the peculiar conditions under which different forms of this fresh-water plant seem to originate in the Lake of Longemer. The basin of this lake was once occupied by a glacier, and now presents several different sorts of bottom. The soil to a depth of two to three metres is composed in part of a gravel formed of rock *débris* united by an iron cement, in part of ancient moraines, or where near the surface these will be mixed with the remains of plants and form a pretty tenacious mud. In all these situations *Isoetes* is to be found, but the plants differ most remarkably both as to their form, their structure, and their mode of reproduction as they are found in the different habitats. Taking the leaf-development as a guide, four varieties are easily discerned:—(1) *humilis*, growing sparsely in the gravel and sterile shallows, the leaves are not only few in number, but always of diminutive dimensions; sporangia generally wanting or represented by a small cellular mass which rarely ever forms a propagule, and then these with puny leaves; (2) *stricta*, found on the borders of the lake or in the old alluvial, therefore in less sterile quarters than the preceding; leaves more numerous, stout, but still of small size; (3) *intermedia*, growing on ground formed of a mixture of mud and clay, either on the borders of the lake or at a depth of from one to two metres, leaves quite intermediate in character between the previous variety and the next; (4) *elatior*, growing on the clayey depths, with long leaves. The first form is always found isolated, and as to its asexual reproduction there is nothing more to be said; but the other three, according as they are subject to more or less heat, present each three varieties characterised by the mode of reproduction. 1. *Sporifera*, isolated individuals, mostly furnished with well-developed sporangia, stem large, roots numerous, leaves large. 2. *Gemmifera*, few fertile sporangia, but most of the leaves are furnished with propagula, and these well furnished with leaves, generally dextral, stem fairly developed. 3. *Sterilis*, individuals growing in compact masses, stems and roots slender, leaves not numerous, long and narrow, fertile sporangia very rare, and more often undeveloped masses of cells or abortive propagula. It would seem as if these facts had a practical interest to the collector, who may find in them a guide as to where to look for fertile specimens.

GEOGRAPHICAL NOTES

ON Friday, April 1, the French Geographical Society held a meeting in the large hall of the Sorbonne for the reception of Dr. Lenz on his return from Timbuctoo. M. Milne-Edwards was in the chair. Dr. Lenz, as our readers know, has been very successful, although his conclusions are adverse to the construction of a railway from the Niger to Algeria throughout the Sahara. On the following morning the Society received a telegram stating that Col. Flatters had been murdered by Touaregs at some distance from the Lebkhha Amagdor. In the evening the sad news was confirmed by an official message, stating that four starving Arabs from the mission had arrived at Ouargla, and that the Khobfa had left with four hundred mehari and camel horsemen to rescue the survivors, who were besieged south of Messaguer in the Touat region proper. Happily the news of the disaster to Col. Flatters' expedition has not yet been further confirmed, and authorities in Paris are inclined to believe that it has been much exaggerated, and that the story of the four natives has many elements of suspicion about it.

DR. LENZ, in his lecture at Paris, gave some interesting details on the present condition of Timbuctoo. Its houses are built of brick, and the population is now only 20,000. It has greatly

decayed, and the inhabited part of the town is surrounded by great spaces covered with ruins. There are numerous schools and rich libraries. Dr. Lenz had a cordial reception, and every night during his twenty days' stay he was present at religious conferences which the learned men of the city held with his interpreter; the commentaries on the Koran formed the only subject of conversation. Timbuctoo is united with the Niger, six miles off, by a series of lakes, formerly canals. Dr. Lenz has also made some interesting observations on the Sahara, tending to confirm the conclusions of Rholf's and other recent scientific travellers as to the variety which is to be met with in the great desert. It is really a plateau about 300 metres in altitude, no part of it being below the level of the sea. Granite hills, sandy plains, shallow lakes, fertile oases, alternate over nearly the whole surface, while beasts of prey are rarely to be met with. Dr. Lenz will contribute a full account of his journey to the Berlin Africa Society, in whose journal many of his letters have already appeared.

IT is with sincere regret that we record the death of Lieut. Karl Weyprecht, at the age of forty-three, on March 29, of consumption. Lieut. Weyprecht will be known to our readers as the discoverer, with Lieut. Payr of Franz-Josef Land, in the Austro-Hungarian Expedition of 1872-4. His observations on the aurora borealis were of especial value, and he has published several papers on the subject. He was also the originator of the scheme for establishing a series of international observations around the Pole, which is likely to be realised next year.

THE Rev. G. Brown, the well-known representative of the church militant in the South Pacific, contributes to the new number of the Geographical Society's *Proceedings* a paper descriptive of a recent journey which he has made along the coasts of New Ireland and the adjacent islands, the latter including Sandwich Island, Portland Islands, and New Hanover. Dr. Benjamin Bradshaw, who has spent some years in collecting natural history specimens in the Upper Zambesi region, also contributes a brief paper on the Chobe River, together with a sketch-map of a portion of its course, adding materially to our knowledge of the geography of this region. Mr. Crocker's paper on Sarawak and Northern Borneo, lately read before the Society, is also given, and is illustrated with a good map. The geographical notes are full of interesting matter, one giving an account, by Mr. Sibirakoff himself, of the voyage of the *Oscar Dickson* to the Yenisei Gulf in 1880. Another furnishes conclusive proof of the usefulness of the course of scientific instruction provided by the Council for intending travellers in foreign countries. From the last note we learn that Mr. C. R. Markham, the indefatigable secretary, is preparing for the forthcoming volume of the *Journal* a sketch of the Society's work in the past fifty years.

IN the current number of *Les Missions Catholiques*, Père Richard, a missionary in Algeria, commences an account of his journey, in company with Père Kermaben, among the Tuareg-Azguer tribes of the Sahara. The object of their journey was to study this almost unknown region, and to cultivate friendly relations with the chiefs and people generally with a view to the formation of a missionary station. The more interest attaches to Père Richard's narrative, as it deals with the very region which Col. Flatters has been now exploring with the object of settling the best practicable route for the projected Trans Sahara railway. An entirely new map of this part of Africa, based on Père Richard's notes, accompanies the number.

A LATELY-ISSUED batch of *Reports* from H.M. Consuls (Part vi. of last year) contains useful geographical information respecting portions of South America, that relating to Chili and Peru being specially interesting at the present moment.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE

CAMBRIDGE.—On the 31st inst. the honorary degree of LL.D. was conferred on Prof. Helmholtz of Berlin at a special congregation.

Prof. Humphrey will take his usual May classes for the second M.B. and Natural Sciences Tripos next term, and the demonstrator will give demonstrations of the organs.

Prof. Babington will lecture on botany four times a week next term, beginning April 26. Mr. Hillhouse will give lectures on